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(21) International Application Number: PCT/US97/16187 (22) International Filing Date: 12 September 1997 (12.09.97) (30) Priority Data: 60/025,985 12 September 1996 (12.09.96) US 60/054,528 4 August 1997 (04.08.97) US (71) Applicant (for all designated States except US): NOVARTIS AG [CH/CH]; Schwarzwaldallee 215, CH-4058 Basle (CH). (72) Inventors; and (75) Inventors/Applicants (for US only): LEBEL, Edouard [US/US]; 5803-37 Tattersall Drive, Durham, NC 27713 (US). HEIFETZ, Peter [US/US]; 3916 Sturbridge Drive, Durham, NC 27713 (US). WARD, Eric [US/US]; 917 Benfield Drive, Greensboro, NC 27410 (US). UKNES, Scott [US/US]; 1003 Pinedale Drive, Apex, NC 27502 (US). (74) Agent: MEIGS, J., Timothy; 3054 Cornwallis Road, Research Triangle Park, NC 27709 (US).		(81) Designated States: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>Without international search report and to be republished upon receipt of that report.</i>
(54) Title: TRANSGENIC PLANTS EXPRESSING CELLULOLYTIC ENZYMES (57) Abstract The invention provides novel methods of controlling gene expression in plastids, using an inducible, transactivator-mediated system, and plants comprising the novel expression systems. The present invention further describes the production of cellulose-degrading enzymes in plants via the application of genetic engineering techniques. Cellulase coding sequences are fused to promoters active in plants and transformed into the nuclear genome and the chloroplast genome. As cellulases may be toxic to plants, preferred promoters are those that are chemically-inducible. In this manner, expression of the cellulase genes transformed into plants may be chemically induced at an appropriate time. In addition, the expressed cellulases may be targeted to vacuoles or other organelles to alleviate toxicity problems. The present invention finds utility in any industrial process requiring a plentiful supply of cellulases, but particularly finds utility in the conversion of cellulosic biomass to ethanol.		

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